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MAINTENANCE PERFORMANCE SYSTEM (ORGANIZATIONAL) MOTIVATIONAL FRAMEWORK FOR ORGANIZATIONAL MAINTENANCE

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The purpose of this effort is to develop the Maintenance Performance System-Organizational (MPS-O) which is an integrated system for measuring maintenance performance, diagnosing performance problems, taking corrective actions, and providing training. This report describes the motivational framework for the system and how it was developed from an examination of motivational factors identified in the field and in findings from previous research.

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INTRODUCTION

This report provides a motivational framework for the development and implementation of a performance system for Army organizational-level maintenance. Previous surveys, observations, and measures of organizational maintenance performance revealed a large number and wide variety of specific performance problems. These problems were identified and combined earlier into five primary problem categories—command emphasis, management information, management proficiency, application of resources, and technical proficiency. Descriptions of the specific problems, references to the work from which they were obtained, and the resulting categorizations were presented in a previous report (Harris, 1981). That report also discussed how the five problem categories represented the avenues through which maintenance effectiveness can be enhanced. The motivational framework described in this report was developed within that context.

Motivation is likely to play a critical role in the success or failure of the Maintenance Performance System (Organizational) even though motivation of personnel is not a primary objective of MPS(O) development. Use of the MPS(O) might increase the effectiveness of Army maintenance in many different ways not directly related to motivation: by providing previously unavailable information to maintenance leaders to enhance planning and decision making; by developing and implementing new procedures for better application of resources such as tools, supplies, and technical skills; and by assessing training needs and applying training resources to increase levels of technical proficiency. However, it is unlikely that implementation of the MPS(O) will lead to any of these types of improvements unless the system is designed and implemented within an adequate motivational framework.

The concept of motivation (discussed in the next paragraph) will be important to the MPS(O) in two primary ways. First, motivational factors can be incorporated directly into the design of the MPS(O). That is, elements of the system can be designed to reflect or support critical motivational factors. Second, motivational factors likely to facilitate the acceptance and use of the MPS(O) can be considered. Potential motivational problems can be avoided and factors likely

to enhance acceptance and use can be incorporated. In developing the MPS(O), emphasis is on integrating motivational considerations into the MPS(O) rather than dealing with motivation as something separate from the MPS(O), or as a problem that the MPS(O) will solve.

WHAT IS MOTIVATION?

At the most fundamental level, motivation is the internal process whereby people act to satisfy their needs. An understanding of this process requires an understanding of the various needs that are likely to influence individuals to act in one way or another. Motivation is probably best understood at the level of basic human physiological needs. For example, most people seek food when they are hungry. However, within the context of Army organizational maintenance, satisfying basic human needs explains little about the forces that might have a motivational impact on maintenance personnel. Motivational factors in Army maintenance are primarily psychological in nature, having been strongly influenced by learning and by the values of society.

For purposes of this project, motivation is operationally defined as **the extent to which personnel responsible for maintenance apply their capabilities toward the attainment of maintenance objectives.** This definition restricts the scope to those motivational factors which might have a direct impact on maintenance performance. For example, the definition excludes the construct of job satisfaction, which might or might not be correlated with motivation. As clarified by Herzberg (1968) and others, job satisfaction is more influential in keeping people on the job than with stimulating them to work toward organizational objectives. A person can be happy on the job while contributing little to the success of the enterprise. Thus, while job satisfaction might be relevant to the retention of mechanics in the Army, it is not necessarily relevant to attaining Army maintenance objectives.

MOTIVATION AND ARMY MAINTENANCE PROBLEMS

Conclusions from recent studies suggest that motivational factors should be emphasized in the development of the MPS(O). For example, a report by the U.S. General Accounting Office (1978) identified motivation as the key to improving

maintenance of Army equipment. As part of the assessment of Army maintenance effectiveness the GAO studied five Army units with the help of highly qualified Army inspectors. They found almost 800 deficiencies needing immediate correction, with about half of the defects not previously recognized or reported. They concluded that with increased motivation for maintaining equipment many of the current problems could be corrected and conditions could be improved.

Several primary reasons for low levels of maintenance motivation were identified and described. Insufficient quality control to assure that unit personnel do maintenance work properly and report the condition of their equipment accurately was at the top of the list. According to the GAO report, even when equipment deficiencies were recognized they were not always reported. Because of this, daily equipment condition reports provided unit commanders with invalid information that was of little use in planning maintenance workloads and setting unit priorities. Also identified as important contributors to ineffective maintenance were: non-existent or inadequate on-the-job training programs, and insufficient understanding by leaders of the importance of command emphasis and of how to motivate people to do maintenance and supply duties properly.

A recent study completed for the Defense Advanced Research Projects Agency (Drake, Sanders, Crooks, & Weltman, 1977) is another example of research on military maintenance which concluded that motivation is a critical factor in maintenance effectiveness. The study compared civilian and military organizations that maintain the same types of helicopters. Data for the study were obtained from administration of questionnaires, conduct of in-depth interviews, and measures obtained from weekly performance summaries. The investigators concluded that the military mechanics had less motivation to perform than did their civilian counterparts. They recommended that the maintenance system give greater emphasis to job design and scheduling, provide better preparation for maintenance work through improved on-the-job training, incorporate job enrichment activities, and reduce disruptions in maintenance activities.

TECHNICAL APPROACH

To provide a foundation of information for incorporating motivational concepts into the MPS(O), a listing of motivational factors was developed from

reviews of the general literature. Thirty-one motivational factors were identified and described. Independently, individual and group interviews were conducted with battalion and company officers, maintenance sergeants, and mechanics. The focus of these interviews was on incentives and disincentives which might serve to influence the effectiveness and efficiency with which mechanics performed their jobs. These interviews, all completed within the context of Army maintenance at the organizational level, led to the identification and description of 17 different factors likely to have a motivational impact on the conduct of organizational maintenance.

The motivational factors were screened for potential usefulness in conjunction with development of the MPS(O). Primary considerations were the practical applicability of the factors and the potential impact they might have on maintenance effectiveness at the organizational level. The six factors discussed in the next section of the report emerged from the screening and were incorporated into the motivational framework for the MPS(O).

RELEVANT MOTIVATIONAL FACTORS

Six motivational factors were selected to guide the development of the MPS(O). These factors were selected from lists of factors obtained from field interviews and reviews of previous research. Interviews with maintenance officers, non-commissioned officers, and mechanics responsible for, or engaged in, organizational maintenance produced a listing of 17 potential motivational factors. These are described in Appendix A of this report. A total of 31 factors were identified and described from reviews of previous research on motivation. These are presented in Appendix B.

The many concepts identified from the field and the research literature were assessed for possible integration into the MPS(O). Primary considerations were motivational potential and practicality. The following three criteria were applied to arrive at the resulting set of six factors:

- The extent to which the factor was identified by Army organizational-level maintenance personnel as a need, or as a potential motivational force in their work.
- The extent to which the results of previous research supported the factor as a positive influence on motivation.
- The possibility of incorporating the factor within the scope of the MPS(O), and within the resources available and constraints present in an Army combat battalion.

Admittedly, the process of identifying and defining the lists of motivational factors was a subjective one. So was the application of the criteria used to select the final set of motivational factors. Consequently, to illuminate the process as much as possible, each of the resulting six motivational factors is described in the remainder of this section of the report, along with summaries of the evidence that led to its selection.

PERFORMANCE MEASUREMENT AND FEEDBACK

Maintenance Perspective

Mechanics said that they needed a system to let them know how well they perform their work. They reasoned that without such a system they can neither

learn their jobs properly nor determine what they might be doing wrong. They claimed that lack of performance information reduced motivation to perform well. One mechanic saw the problem this way: "We don't really know if what we have done is right or wrong until it is too late. There doesn't seem to be any communication on it."

While mechanics desired the measurement and feedback of job performance information, officers and motor sergeants thought of feedback in more general terms, such as recognition of a job well done. Neither the officers nor the motor sergeants interviewed mentioned performance measurement as being a potentially motivating force.

Research Findings

Previous research supports the premise that performance measurement and feedback is a powerful motivating force (Bowles, 1966; Ford, 1973; Hackman & Lawler, 1971; Harris & Chaney, 1969; Odiorne, 1965; Pritchard & Montagno, 1978; Steers & Porter, 1979). Performance measurement and feedback is most effective when focused on specific details of specific tasks over specified time periods. Also, direct feedback is better than indirect feedback. Direct feedback comes to the individual directly from the work itself or from the performance measurement system. Indirect feedback comes to the individual via another person, typically the individual's supervisor. However, feedback need not always be provided on an individual basis. Feedback provided to small working groups has also been shown to have a significant positive impact on group performance. An advantage of providing feedback to the group is the promotion of cooperation within the group.

To be most effective, performance measurement and feedback should be completed within the framework of performance objectives or goals (Bowles, 1966; Drucker, 1954; Harris & Chaney, 1969; Oldham, 1976; Patchen, 1970; Steers & Porter, 1979; Wass, 1967). Objectives can be established by the supervisor, in light of organizational requirements, or by employees themselves. To contribute to motivation, goals must be specific, challenging, and yet attainable.

In short, performance measurement and feedback work best when the performance measures are detailed, when feedback is provided directly to

individuals in a timely fashion, and when performance and feedback are related to established objectives that are meaningful to the group.

RESPONSIBILITY

Maintenance Perspective

Mechanics frequently mentioned that unclear lines of authority reduced their motivation for maintenance work. As a consequence of receiving conflicting orders from almost anyone who outranks them, they find it difficult to identify with or assume responsibility for the work they do. In the words of one mechanic, "We really don't know which way to go because we get told one thing by one person and another thing by another person. It seems like everybody is pushing us every which way. When we finally get around to a specific job we don't know who the heck the boss is." Another mechanic states the problem this way: "We've got too damn many bosses. We can't work when we don't know who we are supposed to try and please. We have to answer not just to the people who hold positions like the motor sergeants and platoon leaders, but we have to answer to other ranks even though they theoretically aren't our boss."

Many of the mechanics and motor sergeants believed that some kind of consolidation of maintenance work would not only be better for maintenance effectiveness, but would also enhance the motivation of mechanics. They argued that through consolidation, the lines of authority could be clarified and strengthened.

Research Findings

Responsibility for a job or task should be clearly specified, consistently adhered to, and maintained at the lowest practical level (Ford, 1973; Paul, Robertson, & Herzberg, 1969; Powers, 1972; Sirota & Wolfson, 1972). In organizing work to be consistent with this principle, there are several guidelines to be followed. First, an individual's responsibilities and line of authority should be defined explicitly. Second, to the extent possible, an individual should be able to identify with the work performed. This can be achieved by work assignments in which an individual works on a complete unit or performs an entire task. Third, individual task responsibility should be designed to minimize competition among

members of a work group. Care must be taken to assure that group members are mutually supportive. Although the commitment of individuals to specified work responsibilities is an important motivating factor, lines of authority and levels of responsibility must be created in a manner that will not disrupt the cohesiveness and mutual support of work groups.

COMMUNICATION AND COOPERATION

Maintenance Perspective

Communication and cooperation were a prime concern of mechanics, but not of maintenance officers or motor sergeants. Mechanics felt strongly the need for more cooperation and communication among units and among individuals within a unit. They felt that they could do better work with higher motivation if communication were better throughout the organization. According to one mechanic, "We need to be able to get some cooperation among the group so that we can feel like we can do a good job and have the tools to do a good job." A second mechanic said, "There is a lack of communication throughout the organization. We have a terrible time trying to communicate back and forth with the other groups to see what is going on. Even if we just have a company bull session it would help." A third mechanic suggested, "Maybe some group activities would build up morale."

Research Findings

Individuals generally derive satisfaction from interacting with others; therefore, workers should be given opportunities to develop friendly, cooperative, and supporting relationships with co-workers. If individuals within work groups can be provided with opportunities to exchange information about their jobs, social interaction can be made an integral part of the job. Positive interpersonal relationships help promote a group identity and encourage team work. Motivation and productivity have been shown to be higher in groups which exhibit these characteristics than in groups in which each worker is mainly on his own. Identity with a group within the organization promotes identity with the organization because it is easier for an individual to perceive personal goals as being compatible with organizational goals (Bowles, 1966; Hackman, 1973; Likert, 1953, 1961 and 1967; Patchen, 1970; Porter & Steers, 1973; Sorcher & Meyer, 1968; Staw, 1977; Vroom, 1964).

In an examination of comparable civilian and military maintenance organizations, military work units were found to be more cohesive than civilian ones. In military organizations the attitudes and norms of the group appeared to have a more potent effect on the performance of individuals within the group. Furthermore, group support or group sanctions were found to extend off the job (Drake, Sanders, Crooks, & Weltman, 1977).

PREPARATION FOR THE JOB

Maintenance Perspective

Some mechanics reported they lack motivation because they feel unprepared for performing their assigned maintenance work. Many mechanics felt that they were not properly trained for their work. Motor sergeants also considered inadequate training to be a problem. In the words of one motor sergeant, "Our mechanics come out of school not trained and we don't have time to train them on the job. This creates extra maintenance work and cost, and cuts down on the chances of the individual getting promoted. This is the kind of thing that drives people out of the Army and certainly doesn't motivate them very highly." A mechanic stated the problem this way, "I am working in an area that I really don't know anything about so I really have a lot of problems with it. I don't feel like I am doing a good job and I am getting to where I don't know if I really care about doing a good job." Most mechanics indicated that their skills were obtained mainly by learning from each other on the job.

Research Findings

The amount of motivation on a job may be expected to depend in part on the extent to which a person possesses and values the abilities which are necessary for success on that job. Research data show that when valued abilities are required in a task, concern about work problems are greater, and levels of motivation and performance are higher (Hackman, 1979; Hackman & Lawler, 1971; Patchen, 1970).

Most individuals define interesting or challenging work as that which uses their skills and abilities to the fullest. Furthermore, the opportunity to learn new skills and knowledge can also make work interesting or challenging. Research has demonstrated that individuals are more motivated by work that they perceive to be

interesting and challenging (Athos & Coffey, 1968; Ford, 1973; Gellerman, 1968; Kerr & Rosow, 1980).

There are dangers in making a job too difficult. While motivation tends to increase as task difficulty goes from low to medium, motivation tends to go down where difficulty is very high; that is, where goals are perceived as being unattainable. Consequently, attempts to perform tasks for which there is inadequate preparation are likely to reduce levels of motivation (Latham & Kline, 1974; Patchen, 1970).

In summary, previous research findings suggest that motivation is a function of both the level of skill possessed by the individual and the difficulty of the job or tasks to be performed. An individual who possesses little skill or feels unprepared for a task will have relatively low motivation.

PARTICIPATION IN JOB IMPROVEMENT

Maintenance Perspective

Motivation is enhanced when mechanics perceive that there is a real and continuing effort to improve maintenance jobs and job performance. On the other hand, lack of any apparent effort to improve maintenance is likely to have a negative impact on motivation. For example, the quality, quantity, and appropriateness of tools and equipment were of considerable concern to motor sergeants and mechanics. Dependence on inadequate tools made the mechanics feel they were working under a heavy handicap when performing maintenance work. Mechanics cited examples of tool boxes containing tools hardly ever used, containing tools of poor quality, and missing tools that were most needed.

Many mechanics complained about the technical support that was available. Concerns were voiced about: inability to get parts after normal working hours; delays and errors in delivering parts; inadequate maintenance performed at direct-support level; frequent receipt of parts other than those ordered; and lack of needed technical manuals.

Many mechanics felt that their maintenance world was littered with broken promises and inconsistencies about their jobs. Examples given were: lack of follow-up on work-assignment agreements, lack of availablility of needed technical

information, and inadequate follow-up to control maintenance quality. To the mechanics, the lack of follow-through suggested that nobody cared and, as a consequence, served as an important disincentive to the performance of maintenance work.

Research Findings

Participation of job incumbents in the improvement of their job or in the solution of problems that hinder job performance is an effective way to increase the sustain motivation. An individual who has some say in job improvement solutions becomes more motivated than an individual who must accept solutions imposed from above. The greater the level of participation in the decision-making process, the greater the personal stake in implementing problem-solving procedures (Bowles, 1966; Drucker, 1954; Harris & Chaney, 169; Kerr & Rosow, 1980; MacGregor, 1957; Porter & Steers, 1973; Richins, 1980; Tarter, 1980).

Motivation is increased when supervisors aid subordinates to attain work objectives, and is decreased when supervisors hinder job accomplishment. Therefore, supervisors should form alliances with subordinates to battle the common enemy—problems that affect jobs and job performance (Levinson, 1973; Steers & Porter, 1979).

In summary, there is extensive research support for the motivational value of participation in job improvements. Furthermore, participation can lead to improved performance in two ways: gains realized from the job changes that are made, and the increased motivation generated by the participation process.

RECOGNITION

Maintenance Perspective

Recognition and appreciation for performing maintenance tasks well and performing them under adverse working conditions were cited frequently as an important factor in motivation by all three types of respondents—officers, motor sergeants, and mechanics. However, mechanics were less concerned than officers with formal recognition through awards, letters of commendation, or related methods. Mechanics mainly emphasized the importance of recognition from those for whom their work was performed, such as their supervisors or the operators of

the repaired equipment. A frequent complaint of organizational-level mechanics was that superiors in the chain of command neither understood nor appreciated the conditions under which maintenance work is performed (such as the long hours worked to meet deadlines) or provided any recognition of maintenance performed well under these conditions. Administrative actions taken that appeared oblivious to the mechanic's situation (e.g., receiving guard duty assignments immediately after working overtime to meet maintenance deadlines) reinforced the notion that recognition and appreciation were lacking.

Research Findings

Providing recognition for satisfactory or superior job performance has a positive influence on motivation. Recognition often takes the form of formal awards, commendations, and the like. But there is little evidence that these types of recognition have a sustained positive impact. Long-term impact is more likely to result from recognition that is more immediate and continuous, such as recognition of the role of the individual in the organization, or the results of performance measurement and feedback discussed earlier.

Recognition as a motivating factor is facilitated by two considerations in the job itself. One is the extent to which the individual relates to the task or tasks performed. If the task has unique characteristics, making it distinguishable from other tasks, it permits the individual to relate to the work more readily and to see the contribution of the work in the total organizational effort. Unique task characteristics permit supervisory personnel to more readily recognize successful task accomplishment. The other consideration that facilitates recognition is the extent to which the customer for the work is identifiable and capable of providing feedback on the work. In one sense or another every job has a "customer." The "customer" might be a supervisor, equipment operator, associate, or purchaser (Burack & Smith, 1977; Donnelly, Gibson, & Ivancevich, 1978; Ford, 1973; and Herzberg, 1971).

When workers understand their roles in the organization, their performance improves. Consequently supervisors should ensure each person knows his role in the organization and how his efforts contribute to the total organizational effort. Information flow should be both downward and upward in an organization. Junior

members should be encouraged to ask questions with the expectation that those questions will be answered immediately or as soon as the answer is found. Research has shown that those who do not understand the reasons behind their work, or how their work fits into the total organizational effort, are less motivated than those who do understand these things (Bass & Barrett, 1972; Bowles, 1966; Gellerman, 1968; Latham & Kline, 1974; McNulty, 1973; Porter & Steers, 1973; Sorcher & Meyer, 1968).

MOTIVATIONAL FRAMEWORK

The purpose of the MPS(O) is to help combat battalions realize the highest levels of maintenance performance through the development and effective application of their resources. Since motivation of maintenance personnel is likely to contribute significantly to the attainment of maintenance objectives, factors that influence motivation must be considered and incorporated into the MPS(O) design. Six motivational factors were identified in the previous section of this report; the purpose of this section is to relate the six factors to elements of the MPS(O) and to discuss how each element will promote one or more of the motivational factors. Mechanics and their immediate supervisors are the central figures in this framework. However, others with maintenance responsibilities, such as equipment operators can also be included.

The three principal elements of the MPS(O) likely to have the greatest impact on motivation are performance measures, skill indices, and action meetings. The performance measures and skill indices are products of the Information and Evaluation (I&ES) subsystem. Regularly scheduled action meetings of mechanics and their supervisor transform the information obtained from performance-measure and skill-index reports to specific actions designed to improve maintenance performance.

Relationships among the six motivation factors and three MPS(O) elements are illustrated in Figure 1. A black dot at the junction between a factor and an element indicates a positive relationships between the two. That is, the motivational factor is integrated with the element. The nature and extent of the relationships are described and discussed in this section. Also, the sequence of MPS(O) activities are described in terms of a process-control model for continuous management and improvement of maintenance performance.

MPS(O) PERFORMANCE MEASURES

The I&ES provides many measures of maintenance performance that have the potential for contributing to three motivational factors: maintenance performance measurement and feedback, participation in job improvement, and recognition of the performance and contribution of maintenance personnel. Performance

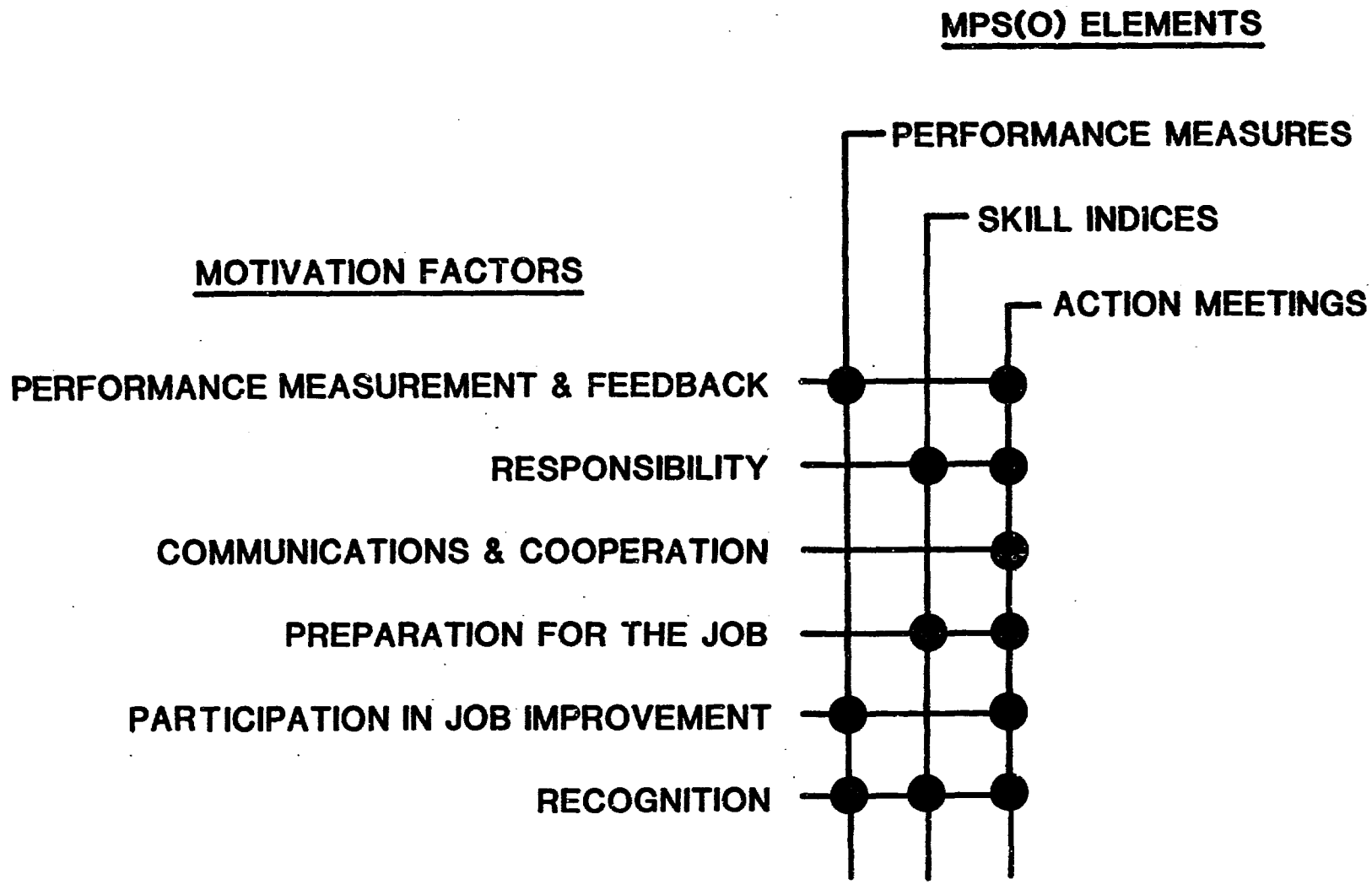

Figure 1. Relationship between MPS(O) elements and factors likely to contribute to the motivation of maintenance personnel.

measures generated by the I&ES can be provided to individuals (managers, supervisors, mechanics) as appropriate and to groups of maintenance personnel assembled in action meetings. Performance measures will be presented in a format that includes trends over time, because the greatest impact on motivation will be reports that show the rates at which different performance measures are changing. This information will help answer questions such as: Are we getting better or worse? Are the actions taken having any effect? The following measures planned for the I&ES have the potential for enhancing motivation through performance measurement and feedback:

- **Mission capable status history:** six-month history of key material readiness information at the company level.
- **Tasks repeated per vehicle:** the rate at which the same corrective maintenance tasks were being repeated on the same vehicles.
- **Fault detection methods:** percentages of the different ways that faults requiring corrective maintenance were first detected.
- **Support maintenance:** the rate at which support maintenance rejected work evacuated to it, and the rate at which support maintenance completed evacuated jobs.
- **Serviceability of replaced components:** the percentage of batteries, regulators, and generators replaced by organizational maintenance personnel, but found by support maintenance repairmen to be serviceable.
- **Crew average corrective maintenance times:** average times required by crews to complete maintenance jobs, or phases of maintenance jobs.
- **Mechanic average corrective maintenance times:** average times required by individual mechanics to complete maintenance jobs, or phases of maintenance jobs.
- **Average mechanic-hours per corrective maintenance task:** average mechanic-hours required to perform each corrective maintenance task.

The performance measures provided by the I&ES are designed to encompass aspects of maintenance work that reflect how well maintenance jobs are being performed. They attempt to cover both the efficiency and the quality of organizational-level maintenance. As a consequence, these measures provide a benchmark for assessing improvements in organizing and completing maintenance jobs. As inputs to maintenance performance improvement meetings, they provide a constructive basis for the active participation of mechanics in job improvement.

Recognition is a motivating force that must come from others—supervisors or peers—and not from the MPS(O). However, unless there is reliable, continuing performance measurement there can be only intermittent and subjective information available to serve as a basis for providing recognition. The performance measures provided by the I&ES can provide the best basis for the recognition of individuals and groups.

MPS(O) SKILL INDICES

Information provided by the I&ES on the skill levels of unit maintenance personnel can reinforce the motivational factors of responsibility, preparation for the job, and recognition. Skill indices provide the following:

- **Skill and skill growth indices for maintenance tasks:** the skill index summarizes the level of proficiency of maintenance personnel within the unit on each maintenance task performed within the unit; the skill growth index is the difference between the index of the current and previous reporting period.

- **Individual skill profile:** a listing of the skill credits for each soldier on each maintenance task within his Military Occupational Specialty (at the outset credits will be earned from task experience; however it may be possible later to also earn credits by passing performance tests and completing training).

The reports provided by the I&ES show, via skill indices, the level of qualification of each mechanic to perform each maintenance task. Skill indices provide a basis for increasing mechanic task responsibility levels as skills are acquired. As mechanics become qualified to perform additional tasks, changes can be made in task assignments. In this manner, the skill indices might also serve as the basis for a mechanic certification program. The feedback and recognition ensuing from this process might motivate mechanics to develop skills more rapidly.

The skill indices provide information needed for the systematic identification of maintenance training needs in the unit. Supervisors and mechanics can readily identify the critical tasks they need to perform. They can also identify which of these tasks mechanics are qualified to perform. The I&ES can also provide priorities for on-the-job training based upon the needs of the unit. Thus, to

the extent to which preparation for maintenance tasks through on-the-job training can motivate maintenance personnel, the skill indices and training support provided by the MPS(O) will promote motivation.

Recognition of an individual's growth in maintenance capability by supervisors and other mechanics is also likely to be a positive motivating force. The skill indices provide a vehicle for recognition that can come in one of two ways. First, the individual who has become proficient on a large number of tasks can be recognized as a highly qualified mechanic. Second, an individual who starts with relatively little capability can gain recognition through the rate at which skills are acquired and capability is gained.

MAINTENANCE PERFORMANCE IMPROVEMENT MEETINGS

Since even the best information cannot lead to improved maintenance performance unless it is acted upon, the MPS(O) includes action meetings for the purpose of transforming information from the I&ES into maintenance improvement actions. Meetings are held every two weeks at which time new or updated maintenance performance information is presented. Principal participants in a meeting are the individuals who make up a formal maintenance work group—a supervisor and the mechanics he supervises. (For example, a meeting might involve a company motor sergeant and assigned mechanics.)

The objectives of a meeting are to assess maintenance performance measures, discuss maintenance performance problems, identify and discuss alternative courses of action, and plan the implementation of selected maintenance improvement actions. To promote communication and coordination with other maintenance individuals or groups, individuals from other organizations could attend the meetings regularly or at the invitation of the group. Also, at times when new or updated skill-index reports become available, the meeting could be devoted primarily to the planning of actions to enhance the skill level and maintenance capability of the group.

In addition to providing the vehicle for transforming information from the I&ES into maintenance improvement actions, the action meetings serve to promote each of the six motivational factors previously discussed. This is accomplished in the following manner:

- The meetings provide the focal point for the **feedback** of **performance measurement** information to work groups. This information is presented within the context of established maintenance objectives, providing direct feedback and supporting data on how well these objectives are being met.

- **Responsibility** is given to mechanics to help solve problems that are blocking the attainment of maintenance objectives. Since actions taken are those suggested and discussed by the group, there is likely to be a greater commitment made by mechanics to assuring the success of these actions.

- The discussions that ensue from the feedback of performance measures from the I&ES, enhance **communications and cooperation** among the work group and others. Communication and cooperation can be extended beyond the work group by including other individuals as participants, such as operational personnel, supply personnel, direct support personnel, and personnel from other maintenance units.

- By translating skill-index information into specific actions, the mechanics and their supervisor make a commitment to each other to improve their **preparation for the job.** By scheduling on-the-job training and obtaining or requesting the required resources during scheduled meetings, training can become a continuing process. Given modest support by battalion and company offices, there is the potential for developing maintenance capabilities rapidly and efficiently. Also, the process can be systematic in which the higher training priorities are addressed first.

- The action meetings contribute directly to motivation gained from **participation in job improvement** because that is essentially what the action meetings are about. They provide a means of making job-improvement suggestions and decisions at the lowest level consistent with doctrine and higher authority.

- The action meetings provide an opportunity for supervisors to **recognize** the contributions made by individuals and the work group to effective maintenance performance and job improvements. The existence of regular job improvement meetings also serves as management recognition of the important role mechanics play in the unit.

MPS(O) ACTIVITY SEQUENCE

The MPS(O) supports maintenance by providing a continuing process of data collection, reporting, assessment/discussion, and maintenance-improvement actions. It provides a basis for controlling maintenance as a continuing on-going process to be monitored and improved. The traditional approach to maintenance, in contrast, deals with maintenance as a collection of discrete actions. The

advantage of basing actions on systematically collected and evaluated information, in a process-control model is the incorporation of potent motivational factors. The process-control model is illustrated by the MPS(O) activity sequence shown in Figure 2, and described in the following paragraphs.

Data are collected describing the performance of maintenance activities in the unit. Data collection employs existing DA forms and supplemental data collection instruments. Collected data are entered into a small computer maintained within the battalion. Employing special programs, the computer transforms data into a set of maintenance performance measures and skill indices. Updated performance measures contribute to skill indices for the most recent period as well as trend information for longer periods. Performance reports are provided every two weeks. Updated skill indices are provided every six weeks. Detailed descriptions of the I&ES along with data collection instruments employed and reports provided were described previously (Simpson, 1981; Simpson, Fuller, & Harper, 1981).

Performance measures and skill indices are reviewed and assessed during regularly scheduled maintenance performance improvement meetings. As discussed earlier, regular participants in these meetings are the supervisor and mechanics that constitute a specific work unit. Other participants might attend regularly or upon invitation. The purpose of the meetings, as the name implies, is to develop specific actions based upon the information coming from the I&ES. Two primary types of actions result from the meetings: job improvement actions and skill growth actions. Job improvements stem from actions directed toward improving maintenance performance through changes made in the way maintenance is performed. These changes might affect corrective maintenance procedures, use of technical information, development and use of job performance aids, organization of the maintenance effort, spare parts supply procedures, management of tools and equipment, quality control, preventive maintenance procedures, management of information, and task assignment procedures. Actions based upon skill indices are directed toward enhancing the capabilities of maintenance personnel. Consequently these actions are primarily concerned with the identification of training requirements, the development and implementation of unit-level training, the

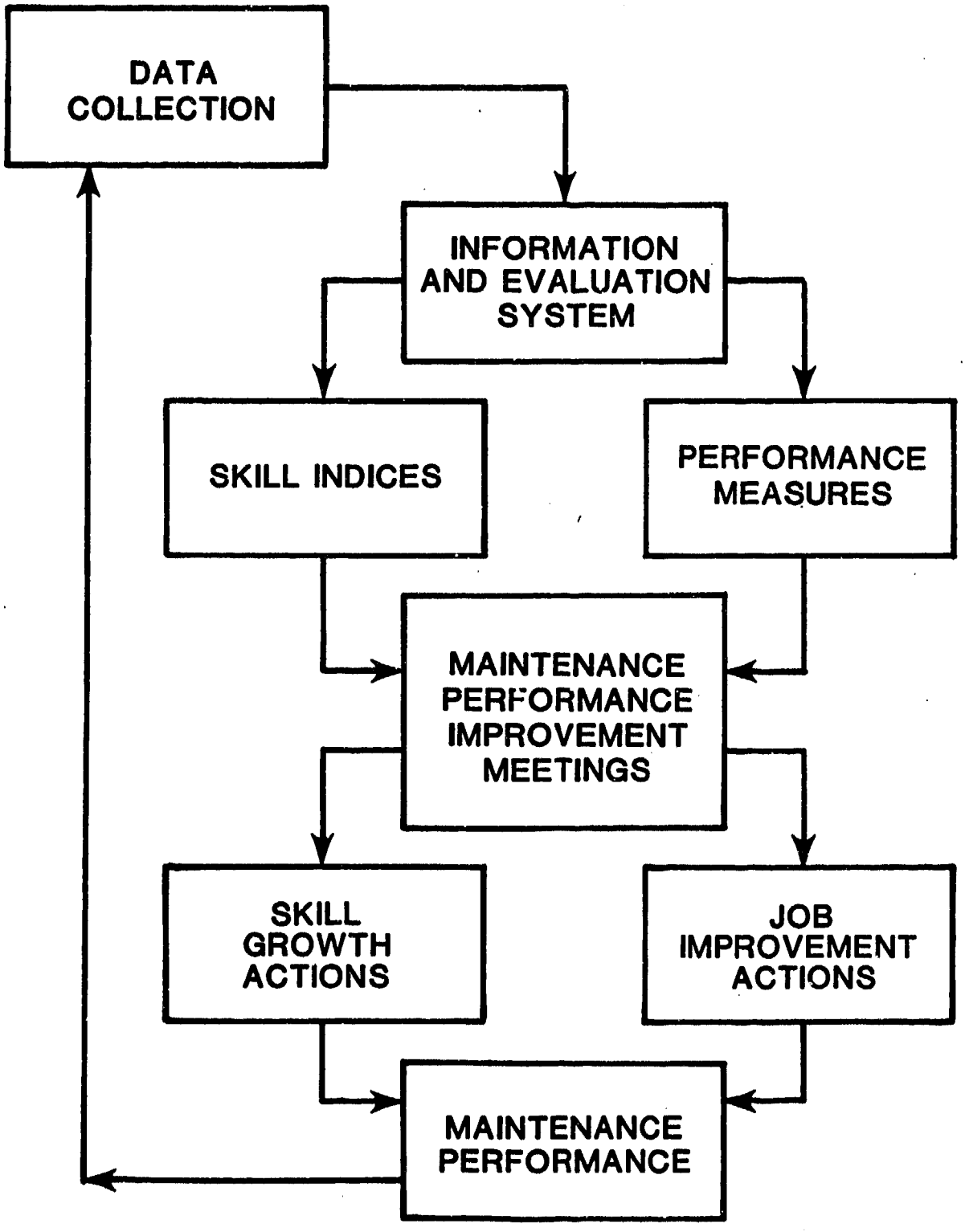

Figure 2. MPS(O) Activity Sequence.

procurement of needed training resources, and work assignment methods that enhance the acquisition of skills.

As these actions are implemented they hopefully increase the effectiveness of organizational-level maintenance. Or, in the face of factors that might otherwise have a negative impact (such as the transfer of highly skilled personnel from the unit, substantial increases in workload, extreme environmental conditions, and other problems outside the immediate control of the unit), they permit acceptable levels of maintenance performance to be maintained. The impact of job improvement actions and skill growth actions on maintenance performance are then reflected subsequently in the data collected and the reports provided for review and analysis during subsequent maintenance performance improvement meetings.

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APPENDIX A
MOTIVATIONAL FACTORS IDENTIFIED IN THE FIELD

Individual and group interviews were conducted with personnel of an Army armor battalion to identify factors likely to influence motivation. Individual interviews were conducted with 15 battalion and company officers--battalion commander, battalion executive officer, battalion motor officer, battalion automotive technician, company commander, and company executive officer. A group interview was conducted with five company motor sergeants. Group interviews were also conducted with 35 battalion and company mechanics in which five or fewer mechanics were interviewed at one time. The focus of all interviews was on factors in organizational maintenance that enhance or detract from the motivation for maintenance work. Motivational factors were identified from content analyses of interview results.

The primary result of this effort was a list of potentially motivating factors. However, an additional finding likely to be of significance for the MPS(O) was the differences in perspective among officers, motor sergeants, and mechanics. Officers tended to emphasize factors that had little immediate impact on the work situation, such as the presentation of formal awards and commendations, opportunities for cross-training, the potential use of incentive pay, and promotional opportunities. Motor sergeants tended to emphasize incentives, such as the availability of resources such as tools and equipment and the provision of special identification for mechanics. In contrast, mechanics were more concerned with factors that affected their immediate work situation. They gave more emphasis to clear lines of authority, performance measurement and feedback, cooperation and communication in the work situation, and better preparation for maintenance work.

Content analyses of the information collected from the field led to the identification of 17 motivational factors. These factors are listed and briefly described below in alphabetical order.

- **Awards/Commendations**
- **Communications**
- **Cross-Training**

- **Fair Working Schedules**
- **Feedback on Performance**
- **Group Cooperation**
- **Incentive Pay**
- **Lines of Responsibility**
- **Mechanic Identification**
- **Performance Measurement**
- **Planning and Time Management**
- **Preparation for Maintenance Jobs**
- **Promotional Fairness and Timeliness**
- **Recognition/Appreciation**
- **Reliable Follow-up**
- **Technical Support**
- **Tools and Equipment Availability**

Awards/Commendations

Several different types of formal awards are now made to maintenance personnel: letters of appreciation, Army commendations, mechanic's badges (specified in AR 670-1), and letters of commendation. Officers tended to place more importance on this type of incentive than did mechanics. However, both recognized that the timeliness of the award is very important and that the burdensome nature of the process required for these awards presently interferes with timeliness.

Communications

Mechanics felt that they could do a better job and would be more highly motivated if communication throughout the organization were better. One mechanic stated, "There is a lack of communication throughout the organization. We have a terrible time trying to communicate back and forth with the other groups to see what is going on. Even if we just had a company bull session, it would help."

Cross-Training

A couple of officers and a motor sergeant thought that cross-training of mechanics might serve as an incentive. For example, a company commander

recommended, "Cross-training in the maintenance sections to build the individual into a little bit of a renaissance man for mechanic's work." A motor sergeant recommended, "Some crossover between unit and direct support assignments would be very helpful. The unit mechanic never gets any real experience other than what he could get in a good gas station." The mechanics themselves did not mention cross-training as a potential incentive. They appeared to be more concerned with getting proper training for the work they were supposed to be doing in the unit. Perhaps if training needs for their primary work were satisfied, cross-training might be emphasized more.

Fair Working Schedules

Officers, motor sergeants, and mechanics generally recognized that mechanics are called upon to work long hours and irregular schedules. This, in itself, did not appear to be of primary concern to the mechanics. They seemed to understand that maintenance must be performed when repairs are needed and that long hours must be devoted at times to meeting maintenance deadlines. The main problem, however, was in providing adequate compensation for working under these conditions, such as compensatory time off or relief from garrison duty details. The apparent lack of fairness becomes acute to them when they see others working shorter, regular hours.

Feedback on Performance

Mechanics want to know how well they are doing (feedback on performance). Feedback requires some method of measuring performance and communicating the results back to the performing individual or group. Officers tended to think in terms of providing formal or informal recognition of a job well done. Mechanics, on the other hand, while acknowledging the need for recognition, indicated they wanted feedback that was more informative than a commendation or pat on the back. One mechanic saw lack of feedback this way: "We don't really know if what we have done is right or wrong until it is too late. There doesn't seem to be any communication on it."

Group Cooperation

Group cooperation was mentioned primarily by mechanics. They felt a need for some way of getting more cooperation between units and among individuals

within a unit. According to one mechanic, "We need to be able to get some cooperation among the group so that we can feel like we can do a good job and have the tools to do a good job." According to a second mechanic, "Tankers who bring in the equipment to be fixed leave when it comes five o'clock and we are left to work until it gets done." A third mechanic suggested, "Maybe some group activities would build up morale."

Incentive Pay

Two of the higher ranking officers mentioned additional pay as a possible incentive. One officer suggested, "Incentive pay to augment regular salary, but I'm not sure how to work it." The other officer stated, "I think that some sort of pro-pay concept would make sense in that it would recognize the proficiency of these people." On the other hand, another officer stated, "I think that non-financial incentives are much more important to the mechanics than financial incentives are." It is also significant that none of the motor sergeants or mechanics mentioned any form of financial incentive.

Lines of Authority

Mechanics frequently mentioned that unclear lines of authority reduced motivation for maintenance work. They find that they are given conflicting orders by almost anyone who outranks them. In the words of one mechanic, "We really don't know which way to go because we get told one thing by one person and another thing by another person. It seems like everybody is pushing us every which way. When we finally get around to a specific job, we don't know who the heck the boss is." Another mechanic said, "The TAMMS Clerk, who is an E5, will order a mechanic to do something. Then, the mechanic gets hell for not being on the job where he is supposed to be." Another mechanic stated the problem this way: "We've got too damn many bosses. We can't work when we don't know who we are supposed to try and please. We have to answer not just to the people who hold positions like the motor sergeant and platoon leaders, but we have to answer to other ranks even though they theoretically aren't our boss." Many of the mechanics and motor sergeants believed that some kind of consolidation of maintenance work would not only be better for maintenance effectiveness but would also enhance the motivation of mechanics.

Mechanic Identification

Motor sergeants and mechanics felt the need for some type of distinguishing identification for mechanics. A patch or badge was suggested to identify a mechanic with the skills possessed and the type of work performed. Distinguishing identification might also promote more team spirit among the mechanics, according to those who suggested this incentive.

Performance Measurement/Quality Control

Mechanics said that they need a system of performance measurement such as quality control checks on their work. They reasoned that without such checks, they can neither learn their jobs adequately nor assess how well they are performing. Lack of satisfactory measures of peformance or quality control ultimately reduces the motivation to perform well. Neither the officers nor motor sergeants interviewed mentioned effective quality control as a potentially motivating force.

Planning and Time Management

All three categories of respondents indicated that effective planning and time management could be a positive incentive for maintenance work. On the other hand, lack of planning and poor time management could be a significant disincentive. According to one officer, "Time management should be in better order so that the people don't have to work the tremendous hours they are asked to." This was reinforced by another officer who stated: "Mechanics work late many, many times, which means that they don't have time to get their personal affairs straightened out and they can't get to these even on the weekends because they frequently are working during these periods as well. Better time management would be an important incentive." A mechanic complains: "The 1st sergeant, the motor sergeant, and the platoon sergeant all seem to fight for our time. We never know what we are supposed to do and we don't like to work that way."

Preparation for Maintenance Jobs

Some mechanics reported they lack motivation because they feel unprepared for performing maintenance work. Many mechanics felt that they were not

properly trained for the work that they were required to perform. Motor sergeants also considered this to be a problem. In the words of one motor sergeant, "Our mechanics come out of school not trained and we don't have time to train them on the job. This creates extra maintenance work and cost and cuts down on the chances of the individual getting promoted. This is the kind of thing that drives people out of the Army and certainly doesn't motivate them very highly." A mechanic stated the problem this way: "I don't know why I am where I am. I was put in my current MOS just by some administrative kind of thing. I am working in an area that I don't really know anything about so I really have a lot of problems with it. I don't feel like I'm doing a good job and I'm getting to where I don't know if I really care about doing a good job." Most mechanics indicated that most of the skills they had were obtained by learning from each other on the job.

Promotional Fairness and Timeliness

The consensus among officers, motor sergeants, and mechanics was that the promotional system worked against the mechanics. One officer stated: "Timely promotions serve as a good incentive but unfortunately, lack of these timely promotions can also be a thing to work against real incentives." Another officer observed, "Make promotions equivalent to those in the combat arms. At the current time, a motor sergeant doesn't make it anywhere as fast as a tank commander, and they see this as a very strong disincentive." Further support came from a motor sergeant who said, "Timely promotions are a big kind of thing. We have people who have been waiting around in a primary zone for months." Another officer observed that, "The mechanics' MOS point requirements are much more difficult than are other MOS's, and this is very discouraging to the mechanics." In general, mechanics did not emphasize the promotional factor nearly as much as the officers and motor sergeants.

Recognition/Appreciation

Recognition and appreciation for performing maintenance tasks well and performing them under adverse working conditions was mentioned frequently by all three types of respondents. This is not formal recognition through awards, letters of commendation, and related methods, but rather recognition that emanates from those for whom work is performed, such as supervisors or equipment operators. A

frequent complaint of organizational-level mechanics was that superiors in the chain of command neither understood nor appreciated the conditions under which maintenance work is performed (such as the long hours worked to meet deadlines) or provided any recognition of maintenance tasks performed well under these conditions. Administrative actions taken that appear oblivious to the mechanic's situation (receiving guard duty assignments immediately after working overtime to meet maintenance deadlines) reinforce the notion that recognition and appreciation are lacking.

Reliable Follow-up

Most of the mechanics felt that their maintenance world was littered with broken promises and inconsistencies. Examples given were: lack of follow-up on work-assignment agreements, slow promotional actions, reversals on qualifications for hometown recruiting assignments, delays in commendations and awards, no follow-up in providing needed training, delays and errors in delivering parts, lack of availability of needed technical information, and no follow-up to control maintenance quality. To the mechanics, the lack of follow-through suggests that nobody cares. As a consequence, it serves as an important disincentive in the performance of maintenance work.

Technical Support

Many of the mechanics complained about the technical support that was available. Concerns were voiced about: inability to get parts after normal working hours, inadequate maintenance performed at direct-support level, frequently receiving parts other than those ordered, and lack of needed technical manuals.

Tool and Equipment Availability

Although an adequate supply of proper tools in good condition might not be a motivating factor, tools that are insufficient in number, inappropriate for the job, and of poor quality, are likely to have a negative influence on motivation. Concern with tools and equipment was voiced primarily by the motor sergeants and mechanics. According to the group of motor sergeants, tools and equipment are major problem areas. Their inadequacy makes the mechanics feel that they are not really effective when performing maintenance work. They cited toolboxes that

contain tools that are hardly ever used, or don't contain tools that are frequently needed. They also stated that the quality of the tools is generally very poor.

APPENDIX B
MOTIVATIONAL FACTORS IDENTIFIED FROM PREVIOUS RESEARCH

Relevant research literature was searched and reviewed to identify factors likely to influence motivation in Army organizational maintenance. Sources searched were primarily the following: Defense Technical Information Center, DIALOG Information Systems, University of California Library, and the project and staff libraries of Anacapa Sciences, Inc. More than seventy documents were obtained from various sources and reviewed in detail. As a result, thirty-one motivational factors were identified. These are listed and briefly described in alphabetical order in this appendix.

Accountability

Responsibility for a job should be assigned to the lowest practical level (Ford, 1973; Paul, Robertson & Herzberg, 1969; Powers, 1972). Work should be organized so that individuals become identified and accountable for their work. In this way an individual's performance becomes more visible to the supervisor and the individual's sense of responsibility for the work is increased. In general, it is easier to maintain accountability when the individual works on a complete unit or performs an entire task. When many persons contribute to the production of a unit or performance of a task, it is more difficult to determine responsibility and to identify accountability.

Autonomy

A person should be free to direct his or her own activities on the job. More control over the means of doing a job leads to more interest in it and fewer absences from it. In general, supervisors should assign tasks, but job incumbents should determine how to perform the tasks. By being able to determine what methods or procedures to use, the individual is likely to view success as a personal achievement. Furthermore, the job incumbent generally has better ideas about performing work efficiently from previous experience. On the other hand, success from following a highly structured specified procedure for a task will not likely be viewed as a personal achievement and, therefore, will have less motivational value. Many studies have shown that individuals working under general supervision in

which objectives are stressed over activities are more productive than those working under close supervision (Drucker, 1954; Gellerman, 1968; Harris & Chaney, 1969; MacGregor, 1957; and Odiorne, 1965).

Availability of Resources

A person should be able to get the things needed to do the job right. Where blockage and frustrations are encountered in getting necessary resources, expectancy of job success will be lowered, and as a consequence, motivation diminished. Obstacles of this type are not necessarily viewed as challenges because they are not intrinsic to the task itself. Although the ready availability of needed resources will usually not increase motivation, the lack of resources will usually decrease motivation (Patchen, 1970, Sirota & Wolfson, 1972).

Congruence of Work and Long-term Goals

Those who see their work as directly related to the attainment of their own individual long-term goals will be more motivated than those who see their work as merely an interim way of supporting themselves while they pursue their long-range goals during off-work hours (Burack & Smith, 1977).

Consideration by Supervision

There are two main patterns of leadership for supervisors: Orientation toward the task or product and orientation toward consideration of employees. The most effective supervisors are those who are above average in consideration of their subordinates. Individuals are more likely to be high producers when supervised by a boss who is genuinely interested in them, their job, their problems, their future, and their well-being. Therefore, the supervisor should form an alliance with his subordinates to fight the common enemy--problems that interfere in attaining common objectives (Harris & Chaney, 1969; Levinson, 1973; Likert, 1967; Steers & Porter, 1979; Vroom, 1964).

Fairness of Pay

Pay is viewed as fair when differentially paid employees see themselves as making differential contributions in their worth to the organization. The perception that pay is fair does not necessarily lead to increased motivation because this

is simply expected as a normal working condition. However, perception of being inequitably paid will probably lead to less motivation. Decreased motivation is likely to be the result, not only if the individual in question perceives himself as getting the worst of the deal, but also if he perceives himself as getting the best of the deal (Bass & Barrett, 1972; Gellerman, 1968; Steers & Porter 1979).

Feedback on Performance

An individual needs to know how well or how poorly he or she has performed. This information cannot be in general terms, but with specific details of specific tasks, during specific time periods. Direct feedback is generally better than indirect feedback. Direct feedback comes to the individual directly from the work itself or from the performance measurement system, while indirect feedback comes to the individual via another person, typically the individual's supervisor. In short, feedback is best when detailed, timely, and related to meaningful objectives (Bowles, 1969; Ford, 1973; Hackman & Lawler, 1971; Harris & Chaney, 1969; Odiorne, 1965; Oldham, 1976; Pritchard & Montagno, 1978; Steers & Porter, 1979).

Freedom of Movement

Individuals are more likely to be motivated in jobs that permit freedom of movement than in jobs which require their physical presence in one location or position for long periods of time. Freedom of movement is especially important if the tasks are routine and similar throughout the day. Freedom of movement provides a person with environmental variation which will serve as a stimulant (Athos & Coffey, 1968; Sorcher & Meyer, 1968).

Goal-setting & Evaluation

To the extent possible, an individual should be permitted to plan, organize and evaluate contributions to organizational objectives. Supervisors should provide a general framework within which individuals or work groups are free to develop specific performance objectives. This process leads to greater commitment to organizational objectives and, as a consequence, greater motivation toward them (Bowles, 1966; Greenblatt, 1973; Latham & Kline, 1974; Sirota & Wolfson, 1972; Sorcher & Meyer, 1968; Steers & Porter, 1979; Tarter, 1980).

Identification With Tasks

Each task should have a natural identity which makes it distinguishable from other tasks and which permits an individual to get some sense of closure--finishing a job that has been started. Furthermore, it permits an individual to perform a complete, natural unit of work. As a consequence, people more readily relate to their work and see more clearly the importance of it in the total organizational effort (Burack & Smith, 1977; Donnelly, Gibson & Ivancevich, 1978; and Herzberg, 1968).

Involvement of Valued Abilities

The amount of pride which comes from success on the job depends in part on the extent to which the person values the abilities which are necessary for success. For example, success in a task requiring relatively high levels of mental capacity might be given greater value than one requiring only steady attention. In general, when valued abilities are required in a task, task performance and individual concern about work problems are greater (Hackman & Lawler, 1971; Patchen, 1970).

Job Enlargement

The periodic integration of new tasks with existing tasks might serve to enhance motivation on the job. These changes should do more than simply enlarge the job with more activities of the same kind. Consequently, new tasks should be sufficiently different so that job content is enriched. Since most people find these changes challenging, they develop new skills and knowledge and increase their levels of motivation. However, changes should be designed carefully so that the addition of new tasks does not result in a job that is too difficult. When difficulty is too high, motivation can decrease because of the perception that there is little chance of success (Burack & Smith, 1977; Drucker, 1954; Herzberg, 1969; MacGregor, 1957; Patchen, 1970).

Job Expectations

Motivation can be decreased by the amount that job expectations differ from job realities. The trend of social and individual values has been to place more importance on what people expect to get out of their jobs. Consequently, discrepancies between expectations and reality are becoming more important.

Today a person says, "Use me well. Let my life mean something." When this expectation is not met, a loss of interest and motivation results (Ford, 1969; Kerr & Rosow, 1980).

Job Placement

Motivation depends upon the job being right for the individual. For example, job requirements must match and challenge the capabilities of the individual. Jobs that present little interest or are far above or below a person's capability are not likely to be motivating for long (Burack & Smith, 1977; Ford, 1973; Patchen, 1970).

Job Rotation

Job rotation is particularly applicable to simple repetitive tasks. It involves moving from one type of work to another to provide variety and renew interest. In this manner, job rotation may have some impact on motivation (McNulty, 1973; Sorcher & Meyer, 1968).

Job Security

Lack of job security might severely affect motivation in a negative way. Fear of the consequences of disagreeing with the supervisor or fear of the impact of economic conditions can lead to preoccupations with job security and, as a consequence, can adversely affect motivation. Thus, job security, while not being a positive motivational force, can free an individual from insecurities to seek motivation from other job factors (Bowles, 1966; Herzberg, Mausner & Snyderman, 1959).

Knowledge of Role in the Organization

When people understand their roles in the organization, their performance generally improves. Consequently, supervisors who are likely to enhance motivation are those who communicate to each person his role in the organization and how the person's efforts contribute to the total organizational effort. During this communication, flow should be both downward and upward in the organization. Individuals should be encouraged to ask questions, and their questions should be answered quickly. Those who do not understand the reasons behind the work or the way in which their work fits into the organizational effort are less motivated than

those who do understand (Bass & Barrett, 1972; Bowles, 1966; Gellerman, 1968; Latham & Kline, 1974; McNulty, 1973; Porter & Steers, 1973; Sorcher & Meyer, 1968).

Opportunity for Interesting/Challenging Work

Work found to be interesting or challenging by the individual is likely to be motivating as well. Opportunities to learn new skills and knowledge is one avenue through which work can be made more interesting or challenging. Perceived difficulty is another avenue. Up to a point, an individual becomes more motivated towards jobs that are perceived as difficult. However, beyond that point, motivation is likely to diminish. There is little motivation to perform jobs that are perceived as being excessively difficult or for which one does not feel reasonably prepared (Athos & Coffey, 1968; Ford, 1973; Kerr & Rusow, 1980; Patchen, 1970).

Organizational Identification

Within an organizational context, motivation is a function of the extent to which the individual identifies with the organization. Organizational identification is influenced by both formal and informal structures. In the Army, formal groups are the battalion, company, platoon, and section. Informal groups are those that share common goals and interests (Finegan, 1977; Levinson, 1973; Patchen, 1970).

Organizational Policy

The policies governing personnel adminstration and work procedures can result in reduced motivation if they are perceived as too restrictive, unfair, or irrational. However, policies with the opposite characteristics do not alone contribute to enhanced motivation (Herzberg, Mausner, & Snyderman, 1959; Porter & Steers, 1973).

Participation in Decision Making

Creating a situation in which workers can participate in the improvement of their jobs, or in the solution of problems that hinder job performance, is one of the most effective ways to increase motivation. An individual who is able to express views about solutions and who has some control over the selection of solutions, problems, or job improvements is more motivated than someone who simply has

solutions or actions imposed from above. The greater the level of participation in the decision-making process, the more that individual has a personal stake in implementing problem-solving procedures (Bowles, 1966; Drucker, 1954; Harris & Chaney, 1969; Kerr & Rusow, 1980; MacGregor, 1957; Porter & Steers, 1973; Richins, 1980; Steers & Porter, 1979; Tarter, 1980).

Performance Measurement

Performance measurement (particularly when combined with knowledge of results) is a powerful motivating force. Performance measurement should be provided, not just in general terms, but with specific details of specific tasks over specified periods of time. To be most effective, performance measurement should be completed within the framework of established performance objectives or goals (Bowles, 1966; Ford, 1973; Hackman & Lawler, 1971; Harris & Chaney, 1969; Oldham, 1976; Patchen, 1970; Pritchard & Montagno, 1978; Steers & Porter, 1979; Wass, 1967).

Peformance Standards

Motivation is increased when specific performance standards are established and each individual knows and understands what the standards are. Standards can be both objectively and subjectively established and measured. However, the standards must be perceived as fair and broadly based (Bowles, 1966; Drucker, 1954; Patchen, 1970; Oldham, 1976; Steers & Porter, 1979).

Positive Co-worker Relationships

Motivation is generally enhanced by friendly cooperative and supporting relationships among co-workers. Consequently, individuals should be provided with opportunities to exchange information about their jobs with co-workers to promote constructive interaction on the job. Furthermore, identity with a group within an organization promotes identity with the organization (Bowles, 1966; Likert, 1953; Patchen, 1970; Porter & Steers, 1973; Sorcher & Meyer, 1968; Staw, 1977).

Promotion

Opportunities for promotion can result in increased motivation. However, certain conditions must exist. First, there must be a very close relationship

between successful job performance and promotions. Second, it must be important to the individual that he advance. Advancing to a less desirable form of work might ultimately lead to reduced motivation. Third, the promotional system must be clearly defined and well understood (Bowles, 1966; Grote, 1972; Herzberg, Mausner & Snyderman, 1959; Vroom, 1964).

Recognition

Providing recognition for satisfactory or superior job performance has a positive influence on motivation. Of the many types of recognition, however, some are likely to be more important than others. For example, there is little evidence that the more formal types of recognition, such as awards, commendations, and the like, have a sustained positive impact. Long-term impact is more likely to result from recognition that is more immediate and continuous, such as recognition of the role of the individual in the organization, or the results of performance measurement and feedback (Bowles, 1966; Harris & Chaney, 1969; Herzberg, Mausner & Snyderman, 1959).

Supervisor Competence

Although a supervisor need not have the level of technical capability of the individual supervised, the supervisor must have sufficient technical competence to permit satisfactory performance in planning, decision making, evaluation, and related supervisory functions. Although working for a technically competent supervisor will not necessarily lead to high levels of motivation, a technically incompetent supervisor will sooner or later adversely affect motivation (Herzberg, Mausner & Snyderman, 1959; Levinson, 1973; Porter & Steers, 1973; Steers & Porter, 1979).

Task Significance

Perception of a job as important to the achievement of organizational goals will enhance motivation, but the perception of a job as having little influence on the organization will diminish motivation. Also, perceptions that the job is important in fulfilling other peoples' needs will lead to greater motivation than perceptions that the job has little impact on others (Burack & Smith, 1977).

Use of Supervisory Authority

The employment of supervisory authority in a manner that replaces evidence and fact as the basis for decisions will lead to reduced levels of motivation. Problems are best solved through candid examination of the issues and resolution gained through mutual understanding. Motivation is achieved through gaining agreement within the limits of authority other than through the use of authority to force conclusions (Blake & Mouton, 1969).

Variety of Job Tasks

Task variety permits individuals to perform different operations, using different procedures and different equipment. Jobs that are high in variety are often viewed as challenging because they require a fuller range of an individual's skills. Most individuals find this type of challenge stimulating and, as a consequence, their motivation to perform increases (Athos & Coffey, 1968; Burack & Smith, 1977; McNulty, 1973).

Work Environment

Sometimes pleasant work surroundings can increase motivation and sometimes unpleasant work surroundings can decrease motivation. Typically, however, work environment is not a very important factor for either increasing or decreasing motivation. Many examples have been cited of extremely motivated individuals in poor working conditions and, conversely, unmotivated individuals in very pleasant working conditions (Bass & Barrett, 1972; Bowles, 1966; Sorcher & Meyer, 1968).